

(19) **United States**

(12) **Patent Application Publication**  
**Gaither et al.**

(10) **Pub. No.: US 2020/0089257 A1**

(43) **Pub. Date: Mar. 19, 2020**

(54) **HOME IMPROVEMENT STORE  
AUTONOMOUS WORKHORSE**

(71) Applicant: **Toyota Motor Engineering &  
Manufacturing North America, Inc.,**  
Plano, TX (US)

(72) Inventors: **Geoffrey D. Gaither**, Brighton, MI  
(US); **Joshua D. Payne**, Ann Arbor, MI  
(US); **Nathan C. Westover**, New  
Hudson, MI (US)

(21) Appl. No.: **16/130,825**

(22) Filed: **Sep. 13, 2018**

**Publication Classification**

(51) **Int. Cl.**  
**G05D 1/02** (2006.01)  
**G05D 1/00** (2006.01)  
**G06Q 10/08** (2006.01)  
**B65G 67/04** (2006.01)  
**B65G 67/24** (2006.01)

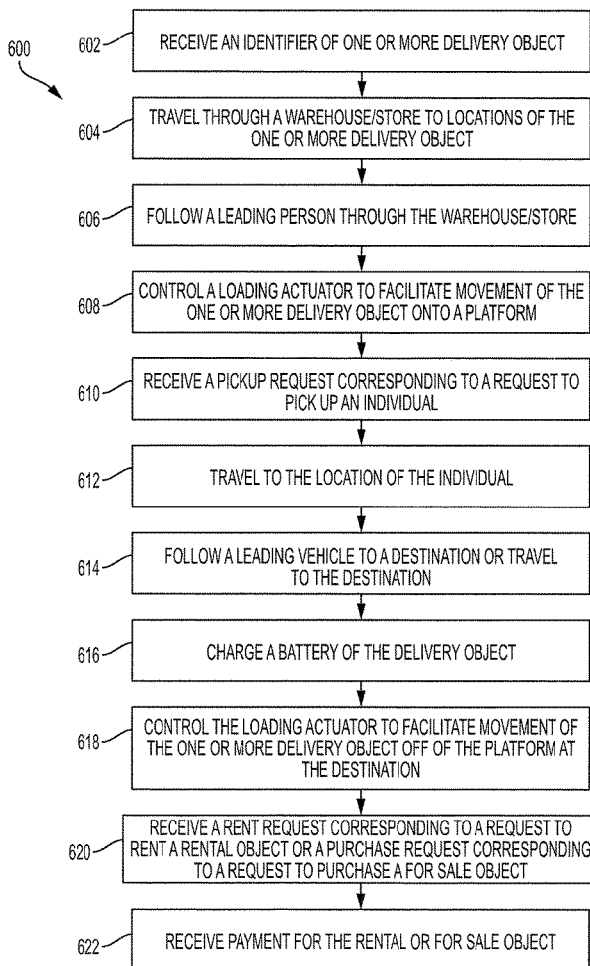
(52) **U.S. Cl.**

CPC ..... **G05D 1/0295** (2013.01); **G05D 1/0088**  
(2013.01); **G06Q 10/083** (2013.01); **G05D**  
**2201/0213** (2013.01); **B65G 67/24** (2013.01);  
**G05D 2201/0216** (2013.01); **B65G 67/04**  
(2013.01)

(57)

**ABSTRACT**

An autonomous workhorse vehicle includes a main body including a platform to support a plurality of objects, a tracking sensor to detect a location of the main body relative to a leading vehicle, and an input/output port to receive an identifier of the leading vehicle. The autonomous workhorse vehicle further includes a power source to provide power to propel the main body, a steering actuator designed to adjust an orientation of the main body, and an ECU. The ECU is designed to receive the identifier of the leading vehicle. The ECU is further designed to determine a following time to begin following the leading vehicle. The ECU is further designed to control the power source and the steering actuator to move the main body to follow the leading vehicle at the following time based on the detected location of the main body relative to the leading vehicle.



TO FIG. 6B

